

**DEPARTMENT OF THE INTERIOR
ELKO FIELD OFFICE
BURNED AREA EMERGENCY REHABILITATION TEAM**

ELKO 21 FIRE COMPLEX

FOREST AND WOODLANDS RESOURCE ASSESSMENT

I. ISSUES

- Reforestation of woodland species within severely burned areas.
- Potential loss of aspen cover type from fire effects.
- Potential loss of woodland cover types from the landscape.

II.

A. Background

Fire History

The 2000 Northern Nevada Complex was an umbrella of numerous fires which occurred on the Elko District. For a complete history of these fires, refer to the Operations Assessment portion of this plan.

The forest and woodlands assessment will only deal with those fires that had a major impact to forest and woodland types. These fires include, Camp, Chokecherry, West Basin, Charlie, Wimpy, Rabbit and South Cricket.

Vegetation

The major woodland species within the fire areas include Pinyon pine (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), and Curlleaf mountain mahogany (*Cercocarpus ledifolius*). Antelope bitterbrush (*Purshia tridentata*) a shrub species, is also mentioned as a vegetation component.

Aspen (*Populus tremuloides*) and cottonwood (*Populus* spp.) are the only significant commercial forest species of concern. Remnant stands of aspen and cottonwood appear widely scattered throughout the district in relatively small stands, many less than 1 acre in size. Relic populations which are typically fragmented and declining in size, still exist along stream courses and around springs and seeps.

The pinyon-juniper cover type was found on all aspects and at elevations generally above 5,500 feet. Aspen was encountered above 6,500 feet. Occasional aspen/cottonwood clones were encountered at lower elevations in draw bottoms, associated with springs and stream courses.

The number and size of the fires involved, and lack of an accurate local database precludes obtaining accurate information on acreage of woodland type within the burned area (or the total woodland acreage burned and to what level of severity). Best estimates on burned woodland acreage is found in Table 1.

Table 1. Burned woodland acreage.

FIRE	BURNED WOODLAND ACREAGE
Charlie	600
Whippy	940
Rabbit	3,520
South Cricket	4,160

Management Direction

Management direction is outlined in the Resource Management Plans for the Elko Field Office and also Normal Fire Rehabilitation Plans (NFRP's). Specific objectives are:

- Manage suitable forested lands for optimum production of woodland products on a sustained-yield basis while protecting sensitive values.
- Maintain where necessary for management those routes currently servicing pinyon-juniper harvest areas.
- Seedlings of native shrubs or trees may be planted as an EFR measure to restore forest productivity.

The primary concern expressed by the district during the Team assessment process was the general decline in acreage of both aspen and woodlands on the landscape due not only to fire loss, but other land management practices as well.

Without active restoration efforts to maintain and reintroduce these species within the Elko Field Area many species will continue to decline.

This report will emphasize on the monitoring and reforestation of these species, as a primary goal of the Field areas effected.

Tree Damage/Mortality

Aspen/cottonwood: Aspen/cottonwood stands were effected within the Camp, Chokecherry and West Basin fires. Many stands carried stand replacement fires while others had only the periphery trees of the stands killed. Mortality occurred from foliage loss as well as cambium damage. All size classes were effected.

Woodland species: Mountain mahogany, pinyon pine and Utah juniper were effected within the Camp, Charlie, Wimpy, Rabbit, West Basin and South Cricket fires. The majority of the mortality in the woodlands appears to be the result of crown fire that raced through the canopy. There is also evidence of prolonged fire resonance time as indicated by ash patterns that suggest heavy contiguous ground fuel existed pre-burn. Many areas in excess of 500 - 1,000 acres in size experienced 100% mortality with no needles or foliage remaining. In areas where burned foliage is still present, the needles are blackened and brittle, indicating dead crowns. The results are that the woodland species in these severely burned areas have been eliminated from the landscape.

Some woodland areas experienced lower fire intensity and mosaic patterns of unburned or partial burned landscapes. These remnant stands will survive and should regenerate naturally. Additional mortality will continue to occur for several years as a result of fire induced stress and loss of photosynthetic capability. Stressed trees also encourage mortality from numerous insect and disease pathogens.

Harvest and Fuels Treatment History

The majority of the burned areas have some history of harvest treatments, which includes harvesting woodland products such as fuelwood, pine nuts, posts and Christmas trees.

The past history of fire suppression activity and the lack of aggressive forest management efforts has allowed many stands to reach high stocking densities and maturity, which contributed to the fire intensity.

B. Reconnaissance Methodology

Burn area assessment consisted of both aerial and ground reconnaissance and mapping. Due to poor access and limited flight time, many areas received no inventory. Other information provided by various resource advisors attached to the Team was used as a source for treatment specification development. Ken Wilkinson and Skip Ritter of the Elko Field Office provided descriptive reports of forest/woodland damage.

C. Findings

Forest Mortality

Levels of fire mortality in woodland areas can generally be categorized as moderate (with less than 30% of the stems killed), mosaic burn (with up to 80% of the stems killed) and stand replacement (> 80% mortality).

Again, due to the magnitude of the fires, areas involved and lack of a BAER forester, accurate mapping of all levels of severity and acres effected was not possible. Suffice it to say however, that there has been a significant loss of the woodland cover type. Detailed estimated volume lost due to these fires was unavailable from the Elko office however, approximately 60% of the woodland acreage was burned on the Charley fire, 65% on Wimpy fire, and 70-80% on the South Cricket and Rabbit fires.

Pre-fire inventory data on the Elko district showed an average of 8 cords and 30 posts per acre. Expanding upon these figures, a conservative estimate of volume lost due to fire indicates more than 73,760 cords of fire wood and 276,600 posts. No estimates have been derived to determine how much of this volume is unavailable for harvest due to poor access and steep terrain.

Potential Reforestation

Even though reforestation can not be approved through the fire rehabilitation process, we are monitoring the stands for natural regeneration, and if natural regeneration does not occur we will plan reforestation through normal MLR or Forest Health and Recovery Act funding sources. Reforestation acreage is based primarily on the ability of the local districts to handle reforestation related contracting activities, as there is certainly more area that requires reforestation than the local resources can handle (if given 10 years to complete). For example potential reforestation acreage on Charlie is 600, 4,160 acres on the South Cricket, 3,520 acres on Rabbit, and 940 acres on the Wimpy fire. Stocking density by species is listed in Tables 2.

Table 2. Planting acreage by species and trees per acre.

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SPECIES	ACRES	TPA
Pinyon pine	230	300
Utah juniper	200	300
Curlleaf mountain mahogany	230	300
Antelope bitterbrush	Inter-planted with	above species

Potential Salvage

Much of the burned area will be opened to the public to harvest usable products. Boundaries will be established on some areas by BLM staff.

Forest Health

Aspen stands that were burned could actually benefit from the effects of the fire. The aspen is expected to sprout rapidly and rejuvenate the clones that remain. During the development of this text, it was documented that aspen suckers were already appearing on some areas. The pre-fire condition of many of these clones contained decadent mature trees that were dying out through natural succession. Post-fire sprouting will return these areas to their early seral stage. Due to many of the stands declining status, some of these areas can be expected to expand in size over the pre-fire acreage.

Woodland species however will experience just the opposite effect. The intensity of the fire has effectively removed extensive areas of tree cover and all associated seed sources. Without management intervention through reforestation, these areas will experience a type conversion within the foreseeable future, from trees to grass and shrub species. It is imperative that a seed source be reintroduced into as many of these areas as possible to enhance regeneration to woodland cover types. Long term benefits of this action will include, restoring wildlife habitat by providing cover and browse species. Tree cover will break up contiguous fuels and may limit the potential for future catastrophic fires. The planting of pinyon pine will provide a future source of pinyon nut for collection by Native Americans. Native Americans have expressed the concern that this crop may have been removed by fire, at public meetings and individually, to the BLM staff on numerous occasions.

III. RECOMMENDATIONS

A. Management (specification related)

The following activities can be accomplished by using EFR funds as outlined in the stipulations section of this plan.

M-2 (BLM 98-148 III O, Q1 and V) Monitoring and Evaluation Emergency Treatments

A. General Description: Monitoring aspen/cottonwood stands with walk-thru examinations or establish a grid of fixed plots to insure that excessive browsing from wildlife and livestock does not inhibit the growth and survival of aspen/cottonwood seedlings and monitor woodland areas with walk-thru examinations to determine acceptable levels of seedling survival. To determine if an acceptable number of quality aspen/cottonwood seedlings have successfully regenerated, and if natural regeneration will produce acceptable numbers of TPA or if additional treatments or protection measures are required. Aspen/Cottonwood protective fencing may require six (6) miles of fencing.

Fencing of selected aspen stands that received stand replacement fire (see Map Index, Treatment Section for location) will allow the aspen stands to regenerate naturally and become fully established without undue pressure from livestock grazing (pending future grazing plans affecting the burn areas). Proposed fencing on Camp will involve 4 miles of fence to protect 70 - 80 acres. Chokecherry and West Basin both have 1 mile of fence and 10 - 15 acres each. Those stands that are not fenced should also be monitored, and grazing restrictions or additional fencing implemented, if necessary, to give these stands a chance to regenerate.

M-2 (BLM 98-148 III O, Q1 and V) Monitoring and Evaluation Emergency Treatments

Monitoring aspen/cottonwood stands with walk-thru examinations or establish a grid of fixed plots to insure that excessive browsing from wildlife and livestock does not inhibit the growth and survival of aspen/cottonwood seedlings and monitor woodland areas with walk-thru examinations to determine acceptable levels of seedling survival. To determine if an acceptable number of quality aspen/cottonwood seedlings have successfully regenerated, and if natural regeneration will produce acceptable numbers of TPA or if additional treatments or protection measures are required. Aspen/Cottonwood protective fencing may require six (6) miles of fencing.

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It is proposed that 660 acres within the Charley, Wimpy, Rabbit and South Cricket fires in the Elko Field Area should be reforested with woodland species including Pinyon pine, Utah juniper, Curlleaf mountain mahogany and Antelope bitterbrush if monitoring shows that natural reforestation isn't occurring. This acreage represents only a fraction of the potential acreage that was exposed to stand replacement fire. Seed collection should occur as soon as possible as a local seed source is preferable to improve the chances of survival. Seed from the district's seed sources is not available at this time, therefore initial planting of 1-0 stock of mountain mahogany and bitter brush will not be available until 2002 when planting should occur on 200 acres of selected sites within the fire. Pinyon and juniper seedlings should be grown for 2 years to produce acceptable sized trees for out planting and should be available in the spring of 2004. Additional stocks of bitterbrush and mahogany can also be grown during this time for planting along with the pinyon and juniper in year 2003-4. All seed should be grown at the U.S. Forest Service Placerville Nursery in California.

The majority of the planting should be contracted with NDF conservation crews and supplemented with planting contracts on a competitive bid process to supplement the production of the NDF crews. This will allow for the reforestation of as much of the area as possible before micro-organisms within the soil begin dying out.

Planting on high productivity sites and in the most severely burned areas should receive the highest priority. This will allow for the reintroduction of a future seed source throughout the effected areas and speed up the reintroduction of the native cover type. Stocking density should be approximately 300 trees per acre (TPA). A spacing guide is not being recommended as specific micro sites should be utilized to increase the potential for seedling success. Pinyon initially requires shade to become established. It should be planted next to stumps, trees or debris to increase its survival potential. Planting units will generally range from 5 to 50 acres in size. Larger blocks may be prescribed during the lay out process.

Efforts on the Elko district should emphasize the treatment of high site productivity areas, with good access, that were exposed to stand replacement fire. This will improve the chances for successful regeneration. Areas that received low to moderate intensity (mosaic) burns and areas with unburned green islands have the ability to assist in providing a seed source for future natural regeneration. Areas with poor regeneration potential should not be considered.

B. Monitoring (specification related)

The following rehabilitation-related monitoring may be accomplished through the use of EFR funds.

M-2 (BLM 98-148 III O, Q1 and V) Monitoring and Evaluation Emergency Treatments

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All burned aspen stands on the Camp, Chokecherry, and West Basin fires should be monitored twice annually for at least 5 years or until seedlings are at least 7 feet tall. This can be accommodated within this plan through the fall of 2003. At that time other funding sources will need to be found to continue this study. Monitoring should insure that a minimum of 850 TPA be established in the sapling size class. These trees should be single stemmed and disease free.

If sufficient numbers of acceptable quality seedlings to provide ingrowth to sapling size are not found to be on the sites, additional measures should be considered (such as restricting grazing or fencing additional stands).

The monitoring proposed for woodland areas is scheduled to take place for three years. Monitoring of the high site potential areas should be accomplished once per year. Monitoring should insure that a minimum of 300 TPA be established.

Minimum acceptable standards of surviving TPA will need to be established by local district staff based on previous reforestation efforts. The key browse species i.e., bitterbrush should not exceed 25% of current years growth from livestock grazing or 50% combined use of wildlife and livestock as measured following winter use by big game (refer to RMP-ROD guidelines).

C. Management (non-specification related)

The following recommendations are not related to plan specifications but should be considered. These can not be accomplished through EFR funding.

Salvage of fire killed trees

Harvest operations should take advantage of fire killed species of commercial size and quality, to be utilized for wood products. Scorched or damaged trees with at least 1/3 live crown should not be harvested as they have the potential to survive and provide a local seed source for natural regeneration. The slash that results from this operation will provide a microsite for future natural and artificial regeneration. Slash left on site will also retard the flow of water and soil movement and help to minimize soil erosion.

Continued reforestation

Failed plantations and other areas that are type converted to grass and shrub land should be considered as candidates for a continuing reforestation program on the districts. A continued effort on the part of management will be required to insure that woodland cover types will remain a viable component of the local ecosystem. Alternative funding sources will need to be located to conduct these projects.

IV. CONSULTATIONS

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V. REFERENCES

Proposed Resource Management Plan and Final Environmental Impact Statement
Elko Resource Area 1986 and Wells Resource Area 1985.

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